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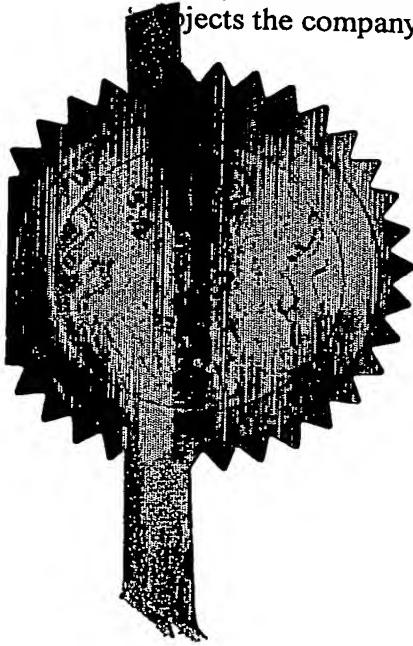
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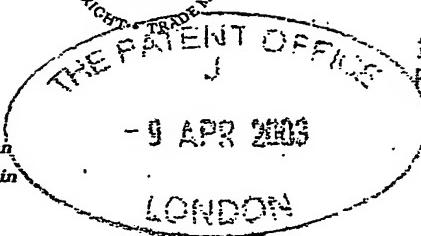
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1/77

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P01/7700 0.00-0308226.0

The Patent Office

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1. Your reference

N.88313 CHM

2. Patent application number

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0308226.0

09 APR 2003

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)KELLY, Joseph Steven
16 Place Farm Way, Monks Risborough
Princes Risborough, Buckinghamshire
HP27 9JH, United KingdomPatents ADP number (*if you know it*)

6845911003

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

TOILET SEAT FITTING

5. Name of your agent (*if you have one*)

J.A. KEMP & CO.

"Address for service" in the United Kingdom to which all correspondence should be sent
(including the postcode)

14 South Square
Gray's Inn
London
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26001

Patents ADP number (*if you know it*)6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*if you know it*) the or each application number

Country

Priority application number
*(if you know it)*Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
*(day / month / year)*8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if*

No

- a) *any applicant named in part 3 is not an inventor, or*
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Patents Form 1/77

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Description	6
Claim(s)	2
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Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

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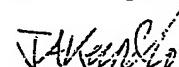
Request for substantive examination
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11.

I/We request the grant of a patent on the basis of this application.

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J.A. KEMP & CO.

Date 9 April 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

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Toilet Seat Fitting

The present invention relates to a fitting for fixing a toilet seat to a toilet pan.

Toilet pans are conventionally provided with a pair of apertures at the rear of the toilet pan for the purpose of fixing a toilet seat to the toilet pan. The conventional fitting provided on the toilet seat for fixing to the respective apertures is a simple screw and nut, the screw extending from a large head. For fixing the toilet seat, the screw is inserted into the aperture in the toilet pan so that the head rests on the upper surface of the toilet pan. Then, the nut is fixed to the screw from beneath the toilet pan and tightened against the lower surface of the toilet pan.

Such a conventional fitting has the benefit that the toilet seat can be fixed securely to the toilet pan in a relatively straightforward manner. However, although attachment of the fitting is simple, it can be unduly time-consuming and awkward, particularly when the toilet pan is arranged in a position which makes the lower end of the aperture difficult to access, for example if the toilet is close to a wall. Also, over time the nut can become loose. Thus, unless the nut is periodically re-tightened, the toilet seat can become unstable on the toilet pan. For the user, movement of the toilet seat is uncomfortable and can even be dangerous, particularly for young children and the infirm.

According to the present invention, there is provided a fitting for fixing a toilet seat to a toilet pan, the fitting comprising a post for insertion into an aperture in the toilet pan, the post being adapted to frictionally engage the inner circumferential surface of the aperture.

Such a fitting is very easy to fix to a toilet pan, because it is simply necessary to insert the post into the aperture in the toilet pan with enough force to overcome the frictional engagement between the post and the inner circumferential surface of the aperture. Thereafter, the post is retained in the aperture in the toilet pan by the friction engagement without the need for any other work. In particular, it is not necessary to access the lower surface of the toilet pan which can sometimes be inconvenient and awkward. Furthermore, the fitting does not become loose over time.

Advantageously, the post comprises a plurality of engagement members protruding sideways from the post relative to the direction of insertion into the aperture in said toilet pan, for frictionally engaging the inner circumferential surface of the aperture.

5 Such an arrangement for the post provides a number of advantages in that the members may be shaped to improve the frictional engagement with the inner surface of the aperture. However, as an alternative, the post could provide a solid block filling the aperture.

10 Advantageously, the engagement members are resiliently deflectable rearwardly. Thus the engagement members array be deflected rearwardly on insertion into the apertures. This means the engagement members within the aperture are urged by their own resilience against the inner surface of the aperture. This increases the contact force normal to the contact surfaces which in turn increases the frictional force therebetween.

15 Advantageously, the engagement members are arranged to provide a greater frictional force against movement in a direction opposite to the direction of insertion than against movement in the direction of insertion.

In order to securely fix the toilet seat to the toilet pan, in the direction oposite to the direction of insertion. It is desirable to have a high frictional force against
20 movement of the post out of the aperture. However, by providing a relatively lower frictional force against movement in the direction of insertion, the post may still be easily inserted into the aperture, thereby providing for easy fixing. To so control the relative frictional forces against movement in the opposite directions, the engagement members may be resiliently deflectable rearwardly, the engagement members may
25 have a front surface which is inclined rearwardly, the engagement members may have a rear surface which is inclined rearwardly and/or the engagement members as a whole may be inclined rearwardly. Preferably, these features are applied together, although they may equally be applied in any combination.

30 Preferably, the engagement members extend around the post, preferably continuously. This maximises the surface area for frictional engagement between the

inner surface of the aperture and the post. It also limits sideways movement of the toilet seat fixed by a pair of fittings because the fittings may not move sideways.

Desirably, the engagement members have an outer surface which extends parallel to the direction of insertion for frictionally engaging the inner circumferential surface of the aperture. By providing such a surface, it is possible to maximise the frictional force developed by each member.

Preferably, the fitting further comprises a head from which the post extends, the head extending further than the post sideways relative to the direction of insertion of the post for engaging the toilet pan around the aperture.

10 By coming into contact with the toilet pan around the aperture, the head limits the travel of the fitting on insertion into the aperture and therefore assists easy fixing of the fitting. The engagement between the head and the toilet pan also increases the strength of the fixing in a simpler manner to a conventional toilet seat fitting.

15 Typically, the fitting will be provided with a hinge portion for pivotally coupling the fixing to an annular seat member of a toilet seat. This allows the toilet seat to be raised in a conventional manner.

Usually, the toilet seat fitting will be provided coupled to the annular seat member of a toilet seat, although in principle it could be provided separately and coupled to the annular seat member by the user.

20 To allow better understanding, a toilet seat fixing which embodies the present invention will now be described by way of non-limitative example with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a toilet pan and a toilet seat having a pair of fittings in accordance with the present invention;

25 Fig. 2 is a rear view of one of the toilet seat fittings;

Fig. 3 is a side view of the toilet seat fitting of Fig. 2; and

Fig. 4 is a cross-sectional view taken along the line IV-IV in Fig. 3 of the fitting of Figs. 2 and 3 coupled to the toilet seat and fitted in the toilet pan, the toilet seat and toilet pan being shown partially.

30 Fig. 1 shows a toilet seat 1 having a pair of fittings 2, 3 in accordance with

the present invention. The toilet seat 1 comprises an annular seat member 4 and a lid 5 which are pivotally coupled together to allow the lid 5 to be raised (as shown in Fig. 1) or lowered to cover the annular seat member 4. The form of the annular seat member 4 and the lid 5 are in themselves conventional.

- 5 The fittings 2, 3 are mirror images of each other. The fittings 2, 3 may be provided as a unitary piece, for example by molding from any suitable material typically a plastics material. As shown in Figs. 2 to 4 which are views of one fitting 2, the fittings 2, 3 comprise a head 6 and a post 7. The respective fittings 2, 3 may be fixed to a toilet pan 8 simply by insertion of the post 7 along the direction of
- 10 insertion A in which the post 7 extends into apertures 9 provided in an upper surface 10 at the rear of the toilet pan 8. The head 6 extends sideways relative to the direction of the insertion further than the post 7 and in particular is larger than the aperture 7. Thus, the lower surface 19 of the head 6 contacts the upper surface 10 of the toilet pan 8 around the aperture 9 to limit the travel of the fittings 2, 3.
- 15 Optionally, a seal (not shown) made of a resilient material may be provided between the lower surface 19 of the head 6 and the upper surface 10 of the toilet pan 8 in a conventional manner.

Each head 6 is provided with a cylindrical stub axle 11 on the side of the head relative to the direction of insertion A. The stub axles 11 are mounted in

20 corresponding cylindrical bearing recesses 12 provided in the annular seat member 4. Thus the stub axles 11 each act as a hinge portion for pivotally coupling the respective fitting 2, 3 to the annular seat member 4 of the toilet seat 1.

The posts 7 of the respective fittings 2, 3 will now be described.

Each post 7 comprises a central, cylindrical column 13 extending along the

25 direction of insertion A.

A plurality of engagement members 14 protrude outwardly from the central column 13 that is sideways relative to the direction of insertion A. The engagement members 14 each have the same size and configuration, being annular and extending continuously around the post 7.

30 The engagement members 14 are inclined rearwardly relative to the direction

of insertion A, that is upwardly in Fig. 4. In particular, the engagement members 14 each have a front surface 17 and a rear surface 18 which are both inclined rearwardly. Between the front surface 17 and the rear surface 18, the engagement members 14 have an outer circumferential surface 16 which extends parallel to the direction of
5 insertion A.

The engagement members 14 are larger in the direction perpendicular to the direction of insertion A than the diameter of the aperture 9 of the toilet pan 8. Typically, the aperture 9 will be 15mm in diameter. Therefore, the engagement members 14 have a diameter greater than 15mm, preferably at least 18mm or at least
10 20mm. A preferred diameter for the engagement members is 22mm.

The engagement members 14 have a degree of resilience sufficient to allow them to be deflected rearwardly relative to the direction of insertion A (that is upwardly in Fig. 4) by insertion of the post 7 into the aperture 9. Thus, on insertion of the post 7 into the aperture 9, the engagement members deflect rearwardly so that
15 both a portion of the front surface 17 and the outer circumferential surface 16 of the engagement members 14 is in contact with the inner circumferential surface 15 of the aperture 9. This creates a frictional force between the fittings 2, 3 and the toilet pan 8 against movement of the post 7 along the direction of insertion and along the opposite direction. Furthermore, as a result of the deflection of the resilient members
20 14 within the aperture 9, the resilience of the engagement members 14 urges them outwardly. This increases the contact force between the engagement members 14 and the inner circumferential surface 15 of the aperture 9 normal to those surfaces 15 and 16, which in turn increases the frictional force against movement of the posts 7 relative to the toilet pan 8. If force is applied to remove the fittings 2, 3 in the
25 direction opposite to the direction of insertion A, then engagement members 14 are urged harder against the inner circumferential surface 15 of the aperture, so the contact force and hence the frictional force are further increased.

Thus, both the fact that the engagement members 14 are deflectable and the inclination of the engagement members 14 assist in providing a greater frictional
30 force against movement in the direction opposite to the direction of insertion A than

against movement in the direction of insertion A.

The fittings 2, 3 are fixed securely in the apertures 9, not only by the contact between the engagement members 14 and the inner circumferential surface 15 of the apertures 9, but also by the engagement of the head 6 against the upper surface 10 of
5 the toilet pan 8. Also, the contact between the outer circumferential surfaces 16 of the posts 7 and the inner circumferential surface 15 of the apertures 9 prevents movement of the fittings 2, 3 sideways relative to the direction of insertion A.

Claims

1. A fitting for fixing a toilet seat to a toilet pan, the fitting comprising a post for insertion into an aperture in the toilet pan, the post being adapted to frictionally engage the inner circumferential surface of the aperture.
2. A fitting according to claim 1, wherein the post comprises a plurality of engagement members protruding sideways from the post relative to the direction of insertion into the aperture in said toilet pan, for frictionally engaging the inner circumferential surface of the aperture.
3. A fitting according to claim 2, wherein the engagement members are resiliently deflectable rearwardly.
- 15 4. A fitting according to claim 2 or 3, wherein the engagement members are arranged to provide a greater frictional force against movement in a direction opposite to the direction of insertion than against movement in the direction of insertion.
- 20 5. A fitting according to any one of claims 2 to 4, wherein the engagement members have a front surface which is inclined rearwardly.
6. A fitting according to any one of claims 2 to 5, wherein the engagement members have a rear surface which is inclined rearwardly.
- 25 7. A fitting according to any one of claims 2 to 6, wherein the engagement members are inclined rearwardly.
8. A fitting according to any one of claims 2 to 7, wherein the engagement members extend around the post.

9. A fitting according to claim 9, wherein the engagement members extend continuously around the post.

10. A fitting according to any one of claims 2 to 7, wherein the engagement
5 members are annular.

11. A fitting according to any one of claims 2 to 10, wherein the engagement members have an outer surface which extends parallel to the direction of insertion for frictionally engaging the inner circumferential surface of the aperture.

10

12. A fitting according to any one of claims 2 to 11, wherein the post further comprises a column from which the engagement members protrude.

13. A fitting according to any one of the preceding claims, further comprising a
15 head from which the post extends, the head extending further than the post sideways relative to the direction of insertion of the post for engaging the toilet pan around the aperture.

14. A fitting according to any one of the preceding claims, further comprising a
20 hinge portion for pivotally coupling the fixing to an annular seat member of a toilet seat.

15. A toilet seat comprising an annular seat member pivotally coupled to a pair of
25 toilet seat fixings each according to any one of the preceding claims.

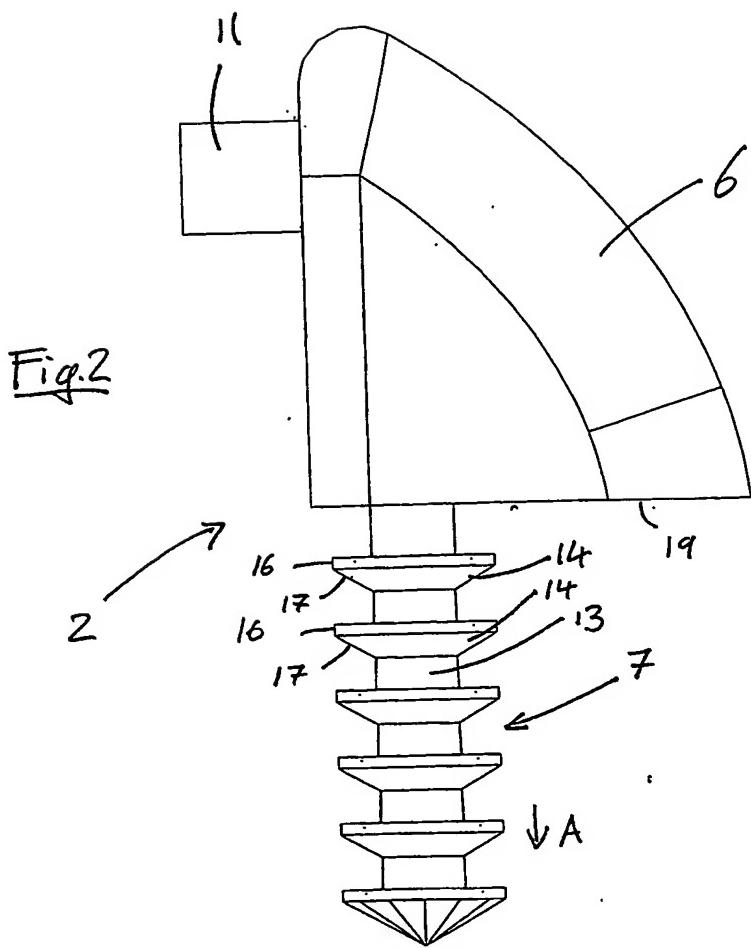
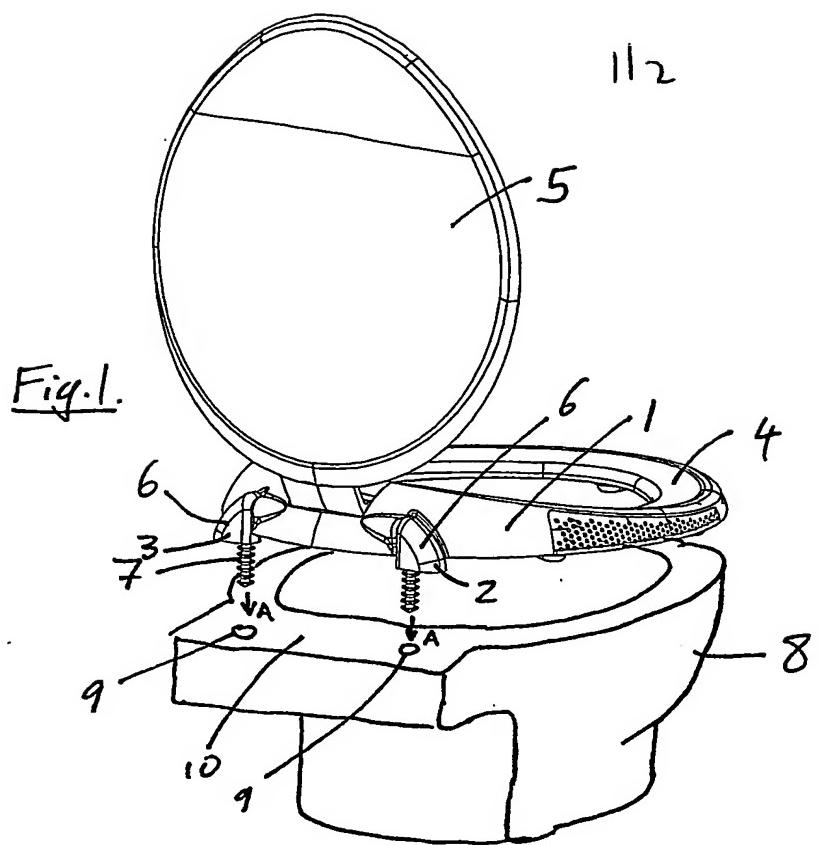
16. A toilet seat according to claim 15, in combination with a said toilet pan having a pair of said apertures.

Abstract

Toilet Seat Fitting

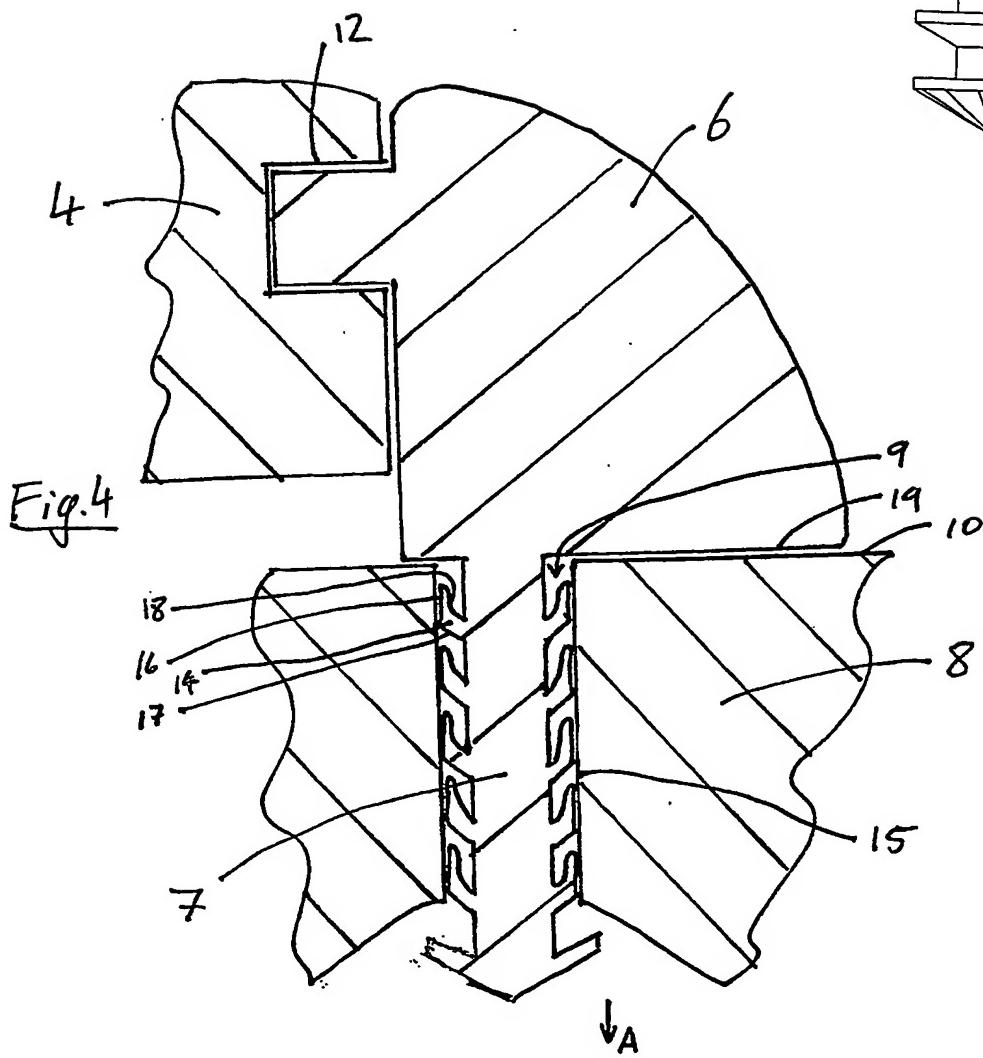
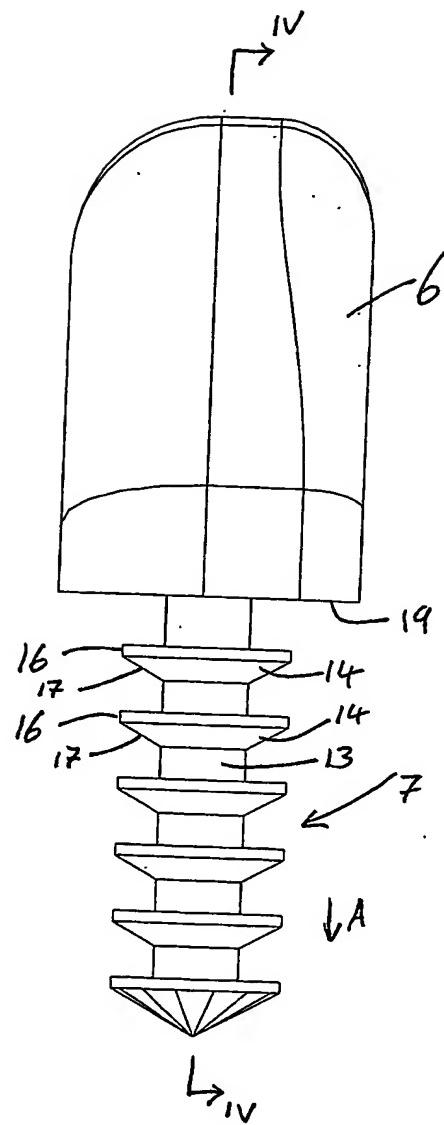
- A toilet seat 1 has a pair of fitting 2, 3 for fixing the toilet seat 1 to a toilet pan 8. Each fitting has a post 7 for insertion into an aperture 9 in the toilet pan 8.
- 5 The posts 7 have a plurality of engagement members 14 which protrude sideways from the post 7 relative to the direction of insertion A into the aperture 9 so as to frictionally engage the inner circumferential surface 15 of the aperture 9. The engagement members 14 are annular and extend continuously around the post 7. The engagement members 14 are inclined rearwardly and are deflectable rearwardly so as
- 10 to provide the greater frictional force in the direction opposite to the direction of insertion A than against movement in the direction of insertion A. The post 7 protrude from a head 6 which engages the toilet pan 8 around the aperture 9.

Fig. 4.



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Fig.3



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